

## REMARKS

Claims 1-15 are in the case and presented for consideration.

The Examiner rejected claims 1-2, and 4 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,486,815 to Wagner, in view of U.S. Patent 4,823,600 to Biegel, et al. The Examiner stated that Wagner discloses a moisture detector circuit comprising the features recited in claim 1, except for the precision rectifier, and that Biegel, et al. disclose a sensor for detecting acoustic vibrations in the ultrasonic range comprising the precision rectifier recited in claim 1. The Examiner, therefore, concludes that the proposed combination of Wagner and Biegel, et al. renders obvious Applicant's claimed invention. See pages 2-4 of the January 4, 2006 Office Action.

In response, Applicant respectfully traverses the Examiner's above ground of rejection. To establish a *prima facie* case of obviousness, the initial burden is on the Examiner to show that there is suggestion or motivation in the reference for modifying or combining the teachings of the reference. See, e.g., MPEP § 2142. It is inappropriate to use Applicant's disclosure as a blueprint (or to use hindsight based on knowledge obtained from application's patent disclosure) to reconstruct the claimed invention from selected pieces of prior art absent some suggestion, teaching, or motivation in the prior art to do so. See, e.g., *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051-52, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988); *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 177 (CCPA 1967), cert. denied, 389 U.S. 1057(1968); *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) ("In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.").

See also the recent Federal Circuit case of *In re Kahn*, Fed. Cir. No. 04-1616, March 22, 2006. See full text at <http://pub.bna.com/ptcj/041616Mar22.pdf>. This case reiterates the requirement at for any obviousness rejection based on a combination of references, the rejection must **articulate the motivation** for combining the references.

In addition, the reference relied upon by the Examiner as a basis for the rejection must be in the field of Applicant's endeavor, or if the reference is not in the field of Applicant's endeavor, then it should be reasonably pertinent to the problem to be solved. See, e.g., MPEP § 2141.01(a)(I).

Applicant's claimed invention uses the dielectric properties of a material to determine its moisture content (see paragraph 2 of the specification). In contrast, Biegel, et al. disclose a sensor for **detecting ultrasonic vibrations** generated by leaks in pipes operated under positive or negative pressure. See Biegel, et al., col. 1, lines 12-14. Contrary to Examiner's assertion (on page 3 of the Office Action), the acoustic vibration sensor taught by Biegel, et al. would not be able to determine the moisture content of a material or substance, to detect whether any leak has developed in a system operating under atmospheric condition, or to distinguish whether the substance escaping from a conduit is a gas or liquid. Biegel, et al., therefore, cannot be properly combined with Wagner because ultrasonic vibration sensors (Biegel, et al.) are ***not in the same field of endeavor as capacitive moisture sensor*** (of the claimed invention).

The Biegel, et al. reference is also ***not pertinent to the problem addressed by*** Applicant because it does not recognize the effect of temperature changes on the diode. While Biegel, et al. use a rectifier, there is no suggestion or teaching that would motivate one of ordinary skill in the art to use the rectifier taught by Biegel, et al. in a capacitive moisture sensor to compensate for the temperature variations in the diode. A person of

ordinary skill in the art in attempting to improve a sensor for measuring the moisture content of a sample, e.g., through surface contact, which can also compensate for the variations in the rectified signal that are due to temperature variations of the diode (see paragraphs 2 and 13 of the specification), would, therefore, not expect to look for a solution in Biegel, et al.

Even assuming, *arguendo*, that the Biegel, et al. reference is analogous art, Applicant maintains that there is no teaching, suggestion or motivation to combine the rectifier of Biegel, et al. with the circuitry of Wagner to arrive at the claimed invention because none of the references applied by the Examiner recognized the advantages of using the precision rectifier, as, e.g., recited in claim 1, to compensate for or to minimize the effect of temperature variations on the diode. Again please see *In re Kahn, supra*.

Additionally, even if Wagner and Biegel, et al. are combined, the resulting structure would ***not include every feature recited in the claims***. Wagner, as read by Applicant, does not teach, disclose or suggest, among other patentable features, the operational amplifier and the associated circuitry of the claimed invention, and the Biegel, et al. reference does not provide the missing teaching. A claim is obvious only if the applied references teach every feature of the claim. The operational amplifier of the claimed invention is adapted to, e.g., obtain a ***difference*** between the two input signals received by the amplifier. Contrary to the Examiner's interpretation, Applicant, who is skilled in the art, hereby offers a more accurate characterization of the teaching of the Wagner reference.

Wagner uses a non-inverting METER (192) DRIVE AMPLIFIER to amplify small variations in DC voltage present at conductor 152 due to sensor center pad signal rectification (not precision rectification) by diode 142. It is also used for resetting a timer

which turns the instrument off after a predetermined time period. In that context, a pulse appears at the output of amplifier 190 at power-up which insures discharge of capacitor C10 via C9 and operational amplifier section feeding D2. C10 will slowly charge through R25 to the point where the operational amplifier supporting R25 will admit of an output state change, swinging in voltage by battery voltage (less amplifier output saturation voltage). Since C10 is discharged as described, the left end of R25 is maintained at the positive saturation voltage of its supporting operational amplifier (not numbered). In turn, that output is connected to the base of transistor Q1 through R9. Q1 is the active element in a Colpitts oscillator for sensor excitation. When C10 charges to a potential determined approximately by the ratio of R24 and R18, the left end of R25 drops suddenly to near ground level, disabling the oscillator and shutting down the instrument. Power to the rest of instrument circuitry is provided by D1 and FET 206 (short circuited by a pushbutton for initial startup).

Therefore, the teaching of Wagner as understood by those skilled in the art, either taken alone or applied in combination with the teaching of Biegel, et al., cannot render claims 1-2, and 4 obvious for the foregoing differences as well as those set forth in detail below:

1. There is NO cancellation of sensor (RF) signal by amplifier 190. That would require capacitive reactance of C7 (156) to be some reasonable value. However, a .01  $\mu\text{F}$  capacitor exhibits a reactance of only 15.9 ohms at the sensor excitation frequency of 1 MHz, essentially zero impedance when compared to other impedances in the circuit. For example, by contrast, resistor R12 is 100K ohms. That RC combination, therefore, does not provide phase shift. In fact, there is no RF of any usable magnitude at node 157 because of the attenuation due to the very low reactance of C7.

2. The amplifier 190 is not used for establishment of a difference between two input signals.

3. The amplifier 190 is used for meter drive as can be seen by reference to figure 2 (Wagner).

4. The time constant of C10 and R25 is 22 seconds. The ratio of R18 and R24 clearly requires charging of C10 to a voltage higher than the 63% single time constant point, which determines the time (about a minute or so) before the instrument automatically turns off. The intent of that portion of circuitry can be clearly discerned by the connection from the timing circuit just described to the oscillator transistor.

5. The very low ratio of C7 reactance and R12 resistance clearly form a filter for removal of the RF sensor excitation from the input to amplifier 190, because the amplifier 190 is used for meter drive as described above. Only the slowly varying DC value present on bus 152 is presented to amplifier 190. This fact, obvious anyone skilled in electronic circuit design, is contrary to the examiner's contention that C7 and R12 form a "phase shift" network. Rather, it is for RF filtering. Applicant is willing to provide the oscilloscope waveforms of that circuitry if requested by the Examiner.

Accordingly, reconsideration and withdrawal of the rejections to claims 1-2 and 4 under 35 U.S.C. § 103(a) is respectfully requested.

Claim 3 is not obvious in view of the applied references (i.e., Wagner, Biegel, et al. and Stockton) for the reasons discussed above, as well as for other reasons which are apparent to those skilled in the art. Namely, the claimed invention uses a reactance-resistance circuit for development of phase shift, ***not impedance matching***. The resistors used in RF impedance matching networks (particularly at higher frequencies

such as the 40 MHz used by Stockton) are used ordinarily *for damping of filter ringing*.

With respect to claim 5, this claim ultimately depends from the independent claim 1, which have been shown to contain subject matter not disclosed by, and, hence, allowable over, the references cited. Accordingly, claim 5 is also allowable by virtue of its dependency from an allowable base claim.

The Examiner rejected claims 6-10 under 35 U.S.C. § 103(a) as being unpatentable over Wagner, in view of Rynhart, et al. (U.S. Published Application No. 2003/0169054) and U.S. Patent 4,845,421 to Howarth, et al. See pages 6-9 of the January 4, 2006 Office Action.

In response, but without conceding the correctness of the Examiner's position, Applicant has amended claim 6. The arrangement of the precision rectifier recited in the claim 6, as amended, and its dependent claims (i.e., claims 7-10) is not disclosed or taught by Wagner, Rynhart, et al. and Howarth, et al. Accordingly, reconsideration and withdrawal of the rejections to claims 6-10 under 35 U.S.C. § 103(a) is respectfully requested.

The Examiner rejected claims 11 under 35 U.S.C. § 103(a) as being unpatentable over Wagner, in view of Rynhart, et al. Claims 12-15 are similarly rejected based on Wagner and Rynhart, et al., and in view of U.S. Patent 5,859,536 to Stockton, Howarth, et al. or Biegel, et al. See pages 9-13 of the January 4, 2006 Office Action.

In response, but without conceding the correctness of the Examiner's position, Applicant has amended claim 11. The arrangement of the precision rectifier recited in the claim 11, as amended, and its dependent claims (i.e., claims 12-15) is not disclosed or

taught by Wagner and Rynhart, et al., or by Wagner and Rynhart, et al. and in view of Stockton, Howarth, et al. or Beigel, et al. Accordingly, reconsideration and withdrawal of the rejections to claims 11-15 under 35 U.S.C. § 103(a) is respectfully requested.

Accordingly, the application and claims are believed to be in condition for allowance, and favorable action is respectfully requested. No new matter has been added.

If any issues remain, the Examiner is respectfully invited to contact the undersigned at the number below to advance the application to allowance.

Respectfully submitted,

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